CLAIMS

I claim:

1.   A dynamic calibration system for monitoring a compressed air driven, pulse tool comprising:

5   a means for measuring air pressure of a pneumatic pulse tool and converting the air pressure into an electrical signal representative of the air pressure;

            a means for electrically computationally processing the electrical signal into another signal representative at least one parameter

10   corresponding to a condition of the tool being monitored which is a function of air pressure;

            a programmed microprocessor configured to identify a portion of the signal representative of the air pressure corresponding to the parameter;

15   wherein the programmed microprocessor is configured to identify and store the parameter of a first threshold air pressure to begin monitoring the parameter of a cycle;

            wherein the programmed microprocessor is configured to identify and store the parameter of a second air pressure to identify a portion of

20   the signal representative of the air pressure of the tool driving a fastener.

            wherein the microprocessor is configured to indicate a pulsing region based on the parameter of the second air pressure;

            wherein the programmed microprocessor is configured to identify a peak air pressure associated with the tool as a clutch shut off;

25   wherein the programmed microprocessor is configured to identify and store a portion of the air pressure as a calibration value for the parameter of the second air pressure;

wherein the programmed microprocessor is configured to identify and store the parameter of a dynamic threshold corresponding to the calibration value; and

wherein the programmed microprocessor is configured to

5   identify and store timers to be associated with the parameters.

2.   A system according to claim 1 wherein the programmed microprocessor is configured to confirm that the measured air pressure in the pulsing region has at least three pulses while the pulse tool is running.

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3.   A system according to claim 2 wherein the programmed microprocessor is configured to identify and store the parameter of three pulses of the pulsing region.

15   4.   A system according to claim 3 wherein the microprocessor is configured to average together the three pulses of the pulsing region to identify an average pulse value.

5.   A system according to claim 4 wherein the three pulses

20   averaged together are a second, third and fourth pulse of the pulsing region.

6.   A system according to claim 4 wherein the microprocessor is configured to identify a percentage of the difference between a highest peak pressure and the average pulsing value as a clutch offset during a calibration

25   phase.

7.   A system according to claim 6 wherein the microprocessor is configured to add the clutch offset to the average pulse value while the tool is running to identify the dynamic threshold corresponding to the calibration value.

8.   A system according to claim 7 wherein the microprocessor is configured to report the dynamic threshold corresponding to the calibration value while the tool is running.

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9.   A system according to claim 7 wherein the microprocessor is configured to use the dynamic threshold to determine when the tool's clutch has activated.

10   10.   A system according to claim 1 wherein the programmed microprocessor is configured to identify and report a completed fastening process,

wherein the programmed microprocessor is configured to identify and report a successful fastening when all of the conditions of the
15   parameters and timers are satisfied; and

wherein the programmed microprocessor is configured to identify and report an unsuccessful fastening when at least one condition of the parameters or timers is not satisfied.

20   11.   A dynamic calibration system for monitoring a direct drive non-pulse tool comprising:

a means for measuring air pressure of a non pulse, direct drive tool and converting the air pressure into an electrical signal representative of the air pressure;
25   a means for electrically computationally processing the electrical signal into another signal representative at least one parameter corresponding to a condition of the tool being monitored which is a function of air pressure;

a programmed microprocessor configured to identify a portion of the signal representative of the air pressure corresponding to the parameter;

wherein the programmed microprocessor is configured to
5   identify and store the parameter of a first threshold air pressure to begin monitoring the parameter of a cycle;

wherein the programmed microprocessor is configured to identify and store the parameter of a second air pressure to identify a portion of the signal representative of the air pressure of the tool driving a fastener;

10   wherein the programmed microprocessor is configured to identify the air pressure associated with the tool running the fastener prior to clutch engagement;

wherein the programmed microprocessor is configured to identify a peak air pressure associated with the tool as a clutch shut off;

15   wherein the programmed microprocessor is configured to identify and store a portion of the air pressure as a calibration value for the parameter of the second air pressure; and

wherein the programmed microprocessor is configured to identify and store the parameter of a dynamic threshold corresponding to the
20   calibration value.

12.   A system according to claim 11 wherein the programmed microprocessor is configured to identify and store an average pressure associated with the tool running the fastener prior to clutch engagement.

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13.   A system according to claim 12 wherein the microprocessor is configured to identify a percentage of the difference between a highest peak pressure and the average pressure as a clutch offset during a calibration phase.

14.   A system according to claim 13 wherein the microprocessor is configured to add the clutch offset to the average pressure while the tool is running to identify the dynamic threshold corresponding to the calibration value.

5   15.   A system according to claim 14 wherein the microprocessor is configured to report the dynamic threshold corresponding to the calibration value while the tool is running.

16.   A system according to claim 11 wherein the programmed microprocessor is configured to identify and store an average pressure associated with the tool in a run down region.

17.   A system according to claim 11wherein the programmed microprocessor is configured to identify and report a completed fastening process,

wherein the programmed microprocessor is configured to identify and report a successful fastening when all of the conditions of the parameters and timers are satisfied; and

wherein the programmed microprocessor is configured to identify and report an unsuccessful fastening when at least one condition of the parameters or timers is not satisfied.